

## AP Calculus AB-2

### Course Description

Calculus 2 is a continuation of Calculus 1 reaching into antiderivative and integration topics. Calculus is a fusion of a variety of mathematical ideas. When approached with a positive and enthusiastic attitude, calculus can be appreciated as a synergistic kind of mathematics where major ideas through the centuries of humankind come together to form a beautiful explanation of concepts like limits, motion, and accumulation. Calculus relies on thinking about mathematics in a different light, where an object approaches a certain value (instead of equals it) and students are asked to evaluate functions at infinity (instead of at real numbers). Topics of study in this semester are Antiderivatives, Riemann Sums, Fundamental Theorem of Calculus, Integration by Substitution and Numerical Integration, Integration with Transcendental Functions, Applications of Integration, and Area and Volume using Integration.

### Prerequisites

PreCalculus 1 and PreCalculus 2, Trigonometry, AP Calculus AB-1

### Course Materials

#### *Required*

- Microsoft Office or Google Docs (See the Minimum Technical Skills and Special Technology Utilized by Students)
- Reliable Internet Access
- Laptop or Desktop (Tablets need Puffin app for internet browsing)
- Adobe Acrobat Reader
- TI-84 Graphing Calculator (TI-83 is also acceptable) or TI-Nspire Graphing Calculator

#### *Recommended*

None

### Course Goals

Upon completion of the course, students will...

- given any of the fundamental integrable functions, find the antiderivative of the function using the appropriate rule.
- apply a u-substitution to integrate functions of the form  $f(g(x))$ .
- find the area under the curve of the function using a definite integral.
- use Riemann sums and the Trapezoidal Rule to approximate definite integrals of functions represented algebraically, graphically, and by a table of values and will interpret the definite integral as the accumulated rate of change of a quantity over an interval interpreted as the change of the quantity over the interval.
- use the Fundamental Theorem of Calculus to evaluate definite integrals, represent a particular antiderivative, and facilitate the analytical and graphical analysis of functions so defined.

- use integration techniques and appropriate integrals to find the area of a region; the volume of a solid with known cross-section, the average value of a function; and the distance traveled by a particle along a line.
- find specific antiderivatives, using initial conditions (including applications to motion along a line). Separable differential equations will be solved and used in modeling (in particular, the equation  $y' = ky$  and exponential growth).

## Units of Instruction

- Unit 4: Integration
- Unit 5: Derivatives and Integration of Logarithmic and Exponential Functions
- Unit 6: Application of Integration (Area and Volumes)

## Assignments

The course includes the following assignments:

1. 1 Discussions
2. 0 Dropboxes
3. 25 Quizzes (Includes Unit Test and Final Exam)

## Grading / Evaluation

### Grading Scheme

Course grades will be determined as follows:

97% or better	A+	77% to 79%	C+
93% to 96%	A	73% to 76%	C
90% to 92%	A -	70% to 72%	C -
87% to 89%	B +	67% to 69%	D+
83% to 86%	B	63% to 66%	D
80% to 82%	B -	60% to 62%	D-
		59% or less	F

## Assignment Descriptions and Weightings

The assignments for this course are weighted as follows:

Assignments	Percentage of Final Grade
Course Work (Discussions, Dropboxes and Quizzes)	80%
Final Exam	20%
<b>Total</b>	<b>100%</b>

## **Instructor Contact Response Time**

Contact information for the Indiana Online Instructor can be found by clicking on the Course Home link in the navigation menu.

The instructor will respond to student inquiries (email, text, call) **within 24 hours**. Assignments will be graded within 24 hours and grades will be posted.

## **Information about Final Exam**

The Final Exam must be proctored. Final Exams count for 30% of the total grade. Coursework and the Final Exam will determine the Final Grade.

## **Expectations for Academic Conduct**

### **Student Handbook**

It is your responsibility to read the [student handbook](#) and contact your instructor if you have any questions.

### **Acceptable Use & Netiquette Policy**

The [Acceptable Use Policy](#) outlines the guidelines and behaviors that all users (administrators, teachers, students and parents) are expected to follow when participating in the Indiana Online program.

### **Academic Integrity**

Honesty is the [Indiana Online policy](#)!

### **CIPA**

The [Children's Internet Protection Act](#) (CIPA) is a federal law enacted by Congress to address concerns about access to offensive content over the Internet on school and library computers.

## **Assistance for Students with Disabilities**

Indiana Online supports an inclusive learning environment for all students. If there are aspects of the instruction or design of this course that hinder your full participation, such as inaccessible web content, or the use of non-captioned videos and podcasts, reasonable accommodations can be arranged.

Learn more about the [accessibility features](#) in Indiana Online's Learning Management System (LMS), Desire2Learn.

### **Suggested Assistive Technologies**

- Screen Readers: [VoiceOver](#) and [NVDA](#)
- Chrome Extensions: [ChromeVox](#) and [Speakit!](#)



### **Minimum Technical Skills and Special Technology Utilized by Students**

This course is totally online. All instructional content and interaction takes place over the internet. In addition to baseline word processing skills and sending/receiving email with attachments, students will be expected to search the internet and upload / download files. In addition, students may need one or more of these [technology plug-ins](#) to access course materials and content.

*Students should have access to Microsoft Office or have an established Google account to work on course documents.*

Technical Questions? Please contact the [Indiana Online Helpdesk](#).